1. Critical thinking: emphasize understanding rationaliztion of logical thinking instead of presdcribed instruciton.
2. Encorage curiosity not this is how it is done mind set
3. Problem solve , be productive and reach out for help when necessary. Each needs to speak up and eweigh in and be impact ful. Step up and weigh in this team looks for advice from all of the subsystem and tie into rest of the system.
4. Generalized Curiosity why do it this way not another method
5. Intellectual curiosity ask questions
   1. Don’t know answer then logically think thru it and ask quesitons
   2. Stability margins gain margins
   3. How to approach a problem figure it out how I think thru it.
6. Derive Equations of Motion
   1. Slosh and flexible modes in atmospheric flight
   2. Slosh modes learn those propelant. Papers NS lost It because of it
   3. Jeff’s question
7. System Identification (Aerospace Related, pneumatics, engines)
   1. Develop strategy in system identification in the absence of the system characterization learning about models. Experimentation, etc. There are other ways to derive it. Characterize it
   2. You don’t have a model
      1. Determine an experimental way to identify the system purely from test data
         1. How do you determine the order of the model ( poles and zeros)
         2. How do you know if it is linear ( does it behave the same for all size of inputs?
8. Classical control Techniques
   1. Frequency domain
      1. Develop a relationship between the frequency domain and time domain
   2. Stability margins
   3. difference between closed loop and open loop response
   4. Take Modern control and state estimation techniques and translate those into frequency domain as well?
   5. Linearize systems and look at it at different ways
      1. Root Locus
      2. Frequency domain
      3. Transfer Functions
      4. State Space
      5. More
      6. Gain an intuition of how they are all different ways of describing the same thing
      7. Learn to interpret Nichols and nyquist and recognize
   6. Differences in sensitivity and
9. Make Kalman filter to estimate the state of the vehicle
   1. Then try to put the Kalman filter into the frequency domain to see what it would look like from a classical controls filter perspective.
10. Develop a controller for it using classical controls techniques
    1. Controls Syst: basics of PID with Aersopace example PID and related to frequency domains and how do they relate in general.
    2. Also how to deal with nonlinearlities with integrater windup.
    3. Lead lag compensators.
    4. familiarity with notch filters and structural modes
    5. Integral controller Why not use it
11. Develop a controller again using modern controls (LQR LQG, etc)
    1. Translate modern control system into the frequency domain to compare it with your classical controller.
12. Navigation questions from tony
    1. GPS
    2. 4th gps
    3. How fast iss turn
13. Frequency sweep and churn test